

## ABSTRACT

An improved optical frequency stabilization unit utilizes the frequency-dependent phase retardation of a birefringent element as a frequency reference.

A light frequency stabilization unit includes a birefringent element having a

- 5 longitudinal axis, the optic axis of the birefringent element is oriented to retard the phase of polarized light propagating through the element parallel to the longitudinal axis. The phase is retarded by an amount that is proportional to the frequency of the polarized light. A polarizer transmits a portion of the phase-retarded light. The magnitude of the transmitted portion is determined by the
- 10 phase retardation amount. A first optical detector is disposed to detect the transmitted portion of light and to generate a first signal in response to the transmitted portion detected.